Biotechnology and Bioengineering

Volume 50, 1996

April 5, 1996

1 On the Issue of Interfacial Activation of Lipase in Nonaqueous Media
A. Louwrier, G.J. Drtina, and A.M. Klibanov

6 Reduction of Porous Media Permeability from In Situ *Leuconostoc mesenteroides* Growth and Dextran Production
R.E. Lappan and H.S. Fogler

16 Protein Refolding at High Concentration Using Size-Exclusion Chromatography
B. Batas and J.B. Chaudhuri

24 Spatial Microbial Distributions of Nitrifiers and Heterotrophs in Mixed-Population Biofilms
S. Okabe, K. Hiratia, Y. Ozawa, and Y. Watanabe

36 On-Line Monitoring of Respiration in Recombinant-Baculovirus Infected and Uninfected Insect Cell Bioreactor Cultures
A.A. Kamen, C. Bédard, R. Tom, S. Perret, and B. Jardin

49 High Pressure, Thermal, and Combined Pressure–Temperature Stabilities of α -Amylases from *Bacillus* Species
C. Weemaes, S. De Cordt, K. Goossens, L. Ludikhuyze, M. Hendrickx, K. Heremans, and P. Tobback

57 Treatment of Trichloroethylene (TCE) in a Membrane Biofilter
M.G. Parvatiyar, R. Govind, and D.F. Bishop

65 An Advanced Image Analysis System for Evaluation of Somatic Embryo Development
C.-M. Chi, C. Zhang, E.J. Staba, T.J. Cooke, and W.-S. Hu

73 A Modeling Framework for the Study of Protein Glycosylation
M. Shelikoff, A.J. Sinskey, and G. Stephanopoulos

91 Prevention of Clogging in a Biological Trickle-Bed Reactor Removing Toluene from Contaminated Air
F.J. Weber and S. Hartmans

98 Application of Light-Emitting Diodes in Bioreactors: Flashing Light Effects and Energy Economy in Algal Culture (*Chlorella pyrenoidosa*)
H.C.P. Matthijs, H. Balke, U.M. Van Hes, B.M.A. Kroon, L.R. Mur, and R.A. Binot

108 High-Level Expression of *lacZ* under Control of the *tac* or the *trp* Promoter Using Runaway Replication Vectors in *Escherichia coli*
J. Kidwell, D. Kolibachuk, and D. Dennis

April 20, 1996

115 Development of Thermophilic Methanogenic Sludge in Compartmentalized Upflow Reactors
J.B. van Lier, N. Groeneveld, and G. Lettinga

125 Dynamic Ultrafiltration Model for Proteins: A Colloidal Interaction Approach
W.R. Bowen and P.M. Williams

136 Biological Sulfate Reduction Using Synthesis Gas as Energy and Carbon Source
R.T. van Houten, H. van der Spoel, A.C. van Aelst, L.W. Hulshoff Pol, and G. Lettinga

145 Simulation of Particle Size Distribution Changes Occurring During High-Pressure Disruption of Bakers' Yeast
S.F. Siddiqi, N.J. Titchener-Hooker, and P.A. Shamlou

151 Aggregation of Ligand-Modified Liposomes by Specific Interactions with Proteins. I: Biotinylated Liposomes and Avidin
N.J. Lynch, P.K. Kilpatrick, and R.G. Carbonell

169 Aggregation of Ligand-Modified Liposomes by Specific Interactions with Proteins. II: Biotinylated Liposomes and Antibiotin Antibody
N.J. Lynch, P.K. Kilpatrick, and R.G. Carbonell

184 Use of the Weighted Jackknife Method to Calculate the Variance in Cellular-Specific Protein Secretion Rate: Application to Monclonal Antibody Secretion Rate Kinetics in Response to Osmotic Stress
X. Yang, G.W. Oehlert, and M.C. Flickinger

197 Increased PHB Productivity by High-Cell-Density Fed-Batch Culture of *Alcaligenes latus*, a Growth-Associated PHB Producer
T. Yamane, M. Fukunaga, and Y.W. Lee

Communications to the Editor

203 Protein Extraction Using the Sodium Bis(2-ethylhexyl) Phosphate (NaDEHP) Reverse Micellar System
Z. Hu and E. Gulari

207 Production and Isolation of Chitosan by Submerged and Solid-State Fermentation from *Lentinus edodes*
C. Crestini, B. Kovac, and G. Giovannozzi-Sermanni

211 Collagenase Digestion of Bone Fragments in Microgravity
M.T. Roedersheimer, C.R. Nunes, and S.J. Simske

217 Growth Kinetics of a Bacteriophage in Continuous Culture
A. Schwienhorst, B.F. Lindemann, and M. Eigen

222 Effects of pH and Aeration on γ-Poly(glutamic acid) Formation by *Bacillus licheniformis* in Controlled Batch Fermentor Cultures
A.-M. Cromwick, G.A. Birrer, and R.A. Gross

228 Erratum

May 5 1996

229 Cell Cycle Analysis of Foreign Gene (β-Galactosidase) Expression in Recombinant Mouse Cells under Control of Mouse Mammary Tumor Virus Promoter
M.B. Gu, P. Todd, and D.S. Kompala

238 Mathematical Modeling and Analysis of Monoclonal Antibody Production by Hybridoma Cells
A.-P. Zeng

248 Efficient Flotation of Yeast Cells Grown in Batch Culture
M.C. Palmieri, W. Greenhalf, and C. Laluce

257 Solvent Effects on the Catalytic Activity of Subtilisin Suspended in Organic Solvents
T. Corrêa de Sampaio, R.B. Melo, T.F. Moura, S. Michel, and S. Barreiros

265 Optimization of the Hydroxylamine Cleavage of an Expressed Fusion Protein to Produce Recombinant Human Insulin-Like Growth Factor (IGF)-I
S.J. Milner, S.M. Thomas, F.J. Ballard, and G.L. Francis

273 Deregulated Expression of Cloned Transcription Factor E2F-1 in Chinese Hamster Ovary Cells Shifts Protein Patterns and Activates Growth in Protein-Free Medium
K.H. Lee, A. Sburlati, W.A. Renner, and J.E. Bailey

280 Extractive Lactic Acid Fermentation in Poly(ethyleneimine)-Based Aqueous Two-Phase System
Y.J. Kwon, R. Kaul, and B. Mattiasson

291 Medium Design Based on Stoichiometric Analysis of Microbial Transglutaminase Production by *Streptoverticillium mobaraense*
Y. Zhu, A. Rinzema, J. Tramper, and J. Bol

299 Metabolic Flux Analysis of Hybridoma Cells in Different Culture Media Using Mass Balances
H.P.J. Bonarius, V. Hatzimanikatis, K.P.H. Meesters, C.D. de Gooijer, G. Schmid, and J. Tramper

319 Membrane Fouling in Sterile Filtration of Recombinant Human Growth Hormone
Y.-F. Maa and C.C. Hsu

329 Active-Site Titration of Serine Protesases in Organic Solvents
P.P. Wangikar, D. Carmichael, D.S. Clark, and J.S. Dordick

Communications to the Editor

336 Two-Dimensional Electrophoresis of Proteins as a Tool in the Metabolic Engineering of Cell Cycle Regulation
K.H. Lee, M.G. Harrington, and J.E. Bailey

341 Expression of Active Spinach Glycolate Oxidase in *Aspergillus nidulans*
M. Devchand, N. Skipper, D.L. Anton, R. DiCosimo, and J.E. Gavagan

May 20, 1996

Special Issue:
Tissue Engineering, Bioartificial Organs, and Cell Therapies: I

Edited by:
William M. Miller and Madhusudan V. Peshwa

347 Preface
W.M. Miller and M.V. Peshwa

Cell Aggregation and Immobilization

349 Fibroblast Aggregation by Suspension with Conjugates of Poly(ethylene glycol) and RGD
W. Dai and W.M. Saltzman

357 Review: Hydrogels for Cell Immobilization
A.C. Jen, M.C. Wake, and A.G. Mikos

365 Transport Characterization of Hydrogel Matrices for Cell Encapsulation
R.H. Li, D.H. Altreuter, and F.T. Gentile

374 Stability of Hydrogels Used in Cell Encapsulation: An In Vitro Comparison of Alginate and Agarose
M.S. Shoichet, R.H. Li, M.L. White, and S.R. Winn

Liver

382 Review: Artificial Liver Support Systems
A. Kamlot, J. Rozga, F.D. Watanabe, and A.A. Demetriou

392 Motility Behavior of Hepatocytes on Extracellular Matrix Substrata During Aggregation
M.J. Powers and L. Griffith-Cima

404 Efficient Assembly of Rat Hepatocyte Spheroids for Tissue Engineering Applications
F.J. Wu, J.R. Friend, C.C. Hsiao, M.J. Zilliox, W.-J. Ko, F.B. Cerra, and W.-S. Hu

416 Improvement of Serum Amino Acid Profile in Hepatic Failure with the Bioartificial Liver Using Multicellular Hepatocyte Spheroids
H. Shiraha, N. Koide, H. Hada, K. Ujike, M. Nakamura, T. Shinji, S. Gotoh, and T. Tsuji

422 Localized Delivery of Epidermal Growth Factor Improves the Survival of Transplanted Hepatocytes
D.J. Mooney, P.M. Kaufmann, K. Sano, S.P. Schwendeman, K. Majahod, B. Schloo, J.P. Vacanti, and R. Langer

Cartilage and Bone

430 Mini-Review: Mechanical Factors Affecting Cartilage Regeneration In Vitro
C.A. Heath and S.R. Magari

438 Mini-Review: Proactive Biomaterials and Bone Tissue Engineering
K.C. Dee and R. Bizios

443 Osteoblast Migration on Poly(α-hydroxy esters)
S.L. Ishaug, R.G. Payne, M.J. Yaszemski, T.B. Aufdemorte, R. Bizios, and A.G. Mikos

Nervous System

452 Stochastic Dynamics of the Nerve Growth Cone and Its Microtubules During Neurite Outgrowth
D.J. Odde, E.M. Tanaka, S.S. Hawkins, and H.M. Buettner

June 5, 1996

Special Issue:
Tissue Engineering, Bioartificial Organs, and Cell Therapies: II

Edited by:
William M. Miller and Madhusudan V. Peshwa

463 Preface
W.M. Miller and M.V. Peshwa

Hematopoietic System

465 In Vitro Characterization of Fetal Hematopoietic Stem Cells: Range and Kinetics of Cell Production from Individual Stem Cells
J.C. Young, D. DiGiusto, and M.P. Backer

479 Cell Growth and Differentiation on Feeder Layers Is Predicted To Be Influenced by Bioreactor Geometry
C.-A. Peng and B.Ø. Palsson

493 Development of Novel Perfusion Chamber to Retain Nonadherent Cells and Its Use for Comparison of Human "Mobilized" Peripheral Blood Mononuclear Cell Cultures with and without Irradiated Bone Marrow Stroma
C.E. Sandstrom, J.G. Bender, W.M. Miller, and E.T. Papoutsakis

505 Different Measures of Human Hematopoietic Cell Culture Performance Are Optimized under Vastly Different Conditions
M.R. Koller, I. Manchel, M.A. Palsson, R.J. Maher, and B.Ø. Palsson

514 Communication: Large-Scale Production of Murine Bone Marrow Cells in an Airlift Packed Bed Bioreactor
J.G. Highfill, S.D. Haley, and D.S. Kompala

Immune System

521 Serum Enhances the Ex Vivo Generation of HIV-Specific Cytotoxic T Cells
L. Trimble, M.-A. Perales, R. Knazek, and J. Lieberman

529 Generation and Ex Vivo Expansion of HTLV-1 Specific CD8+ Cytotoxic T-Lymphocytes for Adoptive Immunotherapy
M.V. Peshwa, L.A. Page, L. Qian, D. Yang, and W.C.A. van Schooten

541 Validation of an Automated Method of Endotoxin Testing for Use in the End-Product Testing of Ex Vivo Activated T-Lymphocytes Used in a Somatic Cell Therapy
Z. Pitkin, P. Chhugani, A. Chenette, Y.-J. Shen, and G.C. du Moulin

Vascular System

548 Cationic Liposomal Delivery of Plasmid to Endothelial Cells Measured by Quantitative Flow Cytometry
W. Tseng, N.B. Purvis, F.R. Haselton, and T.D. Giorgio

555 Effects of Shear Stress on the Growth Kinetics of Human Aortic Smooth Muscle Cells In Vitro
M. Papadaki, L.V. McIntire, and S.G. Eskin

562 Tissue Engineering Lamb Heart Valve Leaflets
C.K. Breuer, T. Shin'oka, R.E. Tanel, G. Zund, D.J. Mooney, P.X. Ma, T. Miura, S. Colan, R. Langer, J.E. Mayer, and J.P. Vacanti

Toxicity Testing and Tumor Cell Responses

568 Measurement of Trans-Epithelial Electrical Resistance in Perfusion: Potential Application for In Vitro Ocular Toxicity Testing
A.S. Pasternak and W.M. Miller

580 Communication: Effect of Culture Age on the Susceptibility of Differentiating Neuroblastoma Cells to Retinoid Cytotoxicity
W.S. Kisaalita and J.M. Bowen

587 Effects of Simulated Microgravity on DU 145 Human Prostate Carcinoma Cells
S. Clejan, K.C. O'Connor, N.L. Cowger, M.K. Cheles, S. Haque, and A.C. Primavera

598 Computerized Analysis of Tumor Cell Interactions with Extracellular Matrix Proteins, Peptides, and Endothelial Cells under Laminar Flow
T.W. Smith, Z. Yun, D.G. Menter, L.V. McIntire, and G.L. Nicolson

June 20, 1996

609 Thermal Inactivation of Immobilized Penicillin Acylase in the Presence of Substrate and Products
A. Illanes, C. Altamirano, and M..E. Zuñiga

617 Correlations for the Partition Behavior of Proteins in Aqueous Two-Phase Systems: Effect of Overall Protein Concentration
A.S. Schmidt, B.A. Andrews, and J.A. Asenjo

627 Optimization of Physical Parameters for Cell Attachment and Growth on Macroporous Microcarriers
Y.-C. Ng, J.M. Berry, and M. Butler

636 Genetic Manipulation of Stationary-Phase Genes to Enhance Recombinant Protein Production in *Escherichia coli*
C.-H. Chou, G.N. Bennett, and K.-Y. San

643 Specific Energy Dissipation Rate for Fluidized-Bed Bioreactors
J.-S. Huang and C.-S. Wu

655 A Comparative Study of the Purity, Enzyme Activity, and Inactivation by Hydrogen Peroxide of Commercially Available Horseradish Peroxidase Isoenzymes A and C
A.N.P. Hiner, J. Hernández-Ruíz, M.B. Arnao, F. García-Cánovas, and M. Acosta

663 Dynamics and Modeling of Temperature-Regulated Gene Product Expression in Recombinant Yeast Fermentation
C. Cheng and S.-T. Yang

675 Steady-State Solution of a Two-Species Biofilm Problem
T. Wik and C. Breitholtz

687 Effect of the Hydration State of Supports Before Lyophilization on Subtilisin-A Activity in Organic Media
J. Kim and B.-G. Kim

693 Determination of Monod Kinetic Coefficients for Volatile Hydrophobic Organic Compounds
S. Guha and P.R. Jaffé

700 Enzymatic Synthesis of a CCK-8 Tripeptide Fragment in Organic Media
M. Capellas, M.D. Benaiges, G. Caminal, G. Gonzalez, J. Lopez-Santín, and P. Clapés

709 Apparent Zero-Order Kinetics of Phenol Biodegradation by Substrate-Inhibited Microbes at Low Substrate Concentrations
M. Shishido and M. Toda